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In Memoriam.

JOHN HILTON, F.R.S.

As no obituary notice of a Surgeon to whom Guy's owes very much has ever appeared in these pages, we have availed ourselves of an opportunity which the death of Mr. Cock—so long associated with Mr. Hilton—has given of making an attempt, though very late in the day, of supplying this omission in our Reports.

As the writer only knew Mr. Hilton during the last years of his life, he would take this opportunity of thanking, cordially, those from whom he received much valuable information as to earlier years.

Much of whatever good there may be in this article must be placed to the credit of the following:—Dr. Pavy, Dr. Pye-Smith, Dr. Goodhart, Dr. Savage, Dr. Constantine Holman, Dr. T. Alpheus Buck, Mr. Birkett, Mr. Durham, Mr. Davies-Colley, and Mr. Couling.

John Hilton was born September 22nd, 1807, on historic ground, at Sible Hedingham in Essex. Two small villages, Sible Hedingham and Castle Hedingham, lie, a little north of Halstead, on the Colne Valley branch of the Great Eastern Railway. The two villages[1] are adjoining, but separated by the Colne. Castle Hedingham, on the east bank, was the chief stronghold of the De Veres, Earls of

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[1] In Sible Hedingham churchyard several stones bear the name of Hilton. Anyone visiting the Hedinghams may, by striking west, across the "Suffolk Way," or the great road between the Roman stations at London and Caister, visit the church of Hempstead, and the grave of Harvey.

Oxford, whose crest of the blue boar (Verres), badge of the mullet, and motto (*Vero nihil verius*) are familiar to all who have seen anything of the Churches and Halls of the Eastern Counties. Here Hilton's eyes must have been early familiar with the great Norman tower, the fine bridge over the ditch, and the old trees on the side of the rising steep which is covered by the remains of the castle. In Sible Hedingham, on the other side of the river, lived Sir John Hawkwood, one of the unscrupulous free-lances of the fourteenth century, who, after beginning life as a tailor, was knighted by Edward III, and afterwards became a leader of Condottieri in the wars of Italy. In return for his services Florence erected a monument to his memory, which may still be seen in her cathedral. Figures of hawks carved in different parts of the English church show that the church was rebuilt either by Sir John or one of his name.

Hilton was educated at the Grammar School at Chelmsford, and at Boulogne-sur-Mer. Some years later, when, as Demonstrator of Anatomy, he revisited the latter place for a holiday, an event occurred which shows what changes have taken place in the last seventy years. While travelling on the top of a diligence Hilton found himself seated next a man in whom, now sleek and prosperous, and dressed in most respectable broadcloth, he recognised one who had retired a few years before from the business of body-snatcher. Conversation promptly followed, and in reply to a question as to what had brought him into France, the body-snatcher replied that he had come over to fetch back one of his daughters who was at school "over there." Hilton, who knew the place, said, "But they only learn a sort of *patois* there." To this the reply was, "Oh no, sir, my daughters learn French and the *patois* too."

Hilton was uncertain whether this worthy was one of the brothers Harnetts or the brothers Crouch. The doings of this quartette of scoundrels are chronicled in the volumes of Bransby Cooper's life of his uncle, in the memorials of J. F. South, and in a diary which, though little known, is perhaps the most remarkable of any that this world has ever contained, 'Diary of a London Resurrectionist, 1812–13,' Royal College of Surgeons' Library. How one of the brothers Crouch was called down from London "in consultation" by Liston (then settled in Edinburgh) to aid him in obtaining the body of a country lad, who, after dying of hydrocephalus, had been buried in a graveyard on the shores of the Firth of Forth; how, for weeks, the friends had succeeded in baffling the body-snatchers; how, when the excitement of the contest between the watchers and the besieging force of body-snatchers had begun to wane, Liston and Ben Crouch came down on the scene, and in thirty minutes of twilight, just before the watchers appeared on the ground, succeeded in carrying off the body, which found a final resting-place in the Museum at Edinburgh—all this will be found told in Dr. Lonsdale's 'Life of Robert Knox,' p. 66. Mr. South states—let us hope incorrectly, and unduly biassed by the rapid success with which Guy's had ousted her elder sister—that the Crouches were the sons "of the carpenter of Guy's Hospital."

Hilton's education seems to have been inadequate and incomplete, but the having to pick up things as he could probably early sharpened his natural shrewdness and acumen. At all events, Hilton's life in this respect is a proof that when a man honestly wins success without the help that a good education, money, or powerful friends can give, there must be something in that man to stamp him as above the common—much in him to honour. And we may go a step further here: it is certain that Hilton's rough outside, his want of personal attractiveness, his reserved, hard manner, and his aversion to society save that of his friends, all pointed to the fact that the early and most impressionable years of his life had been overclouded, and that he had not come out of that time unharmed.

We have no information of Hilton's student days, which must have been about the years 1824 to 1828. One story he left behind which shows how men and manners have changed. The separation between Guy's and St. Thomas's took place in 1825, but a yearly dinner was held at which the staff and their friends met—a meeting still continued under the auspices of the United Hospital Club. In one of his later student years Hilton had an invitation. Men drank hard in those days, and Hilton used to tell how, as chair after chair became vacated, either by the guests leaving or finding repose under, the table,[1] he moved up until he reached a seat of honour at one side of the chairman, the elder Benjamin Travers.[2] It would be interesting to know what passed between the pair. Hilton could not remember how Travers took the intrusion; he only recollected that after getting back to his lodgings in Maze Pond and going to bed he woke up in the middle of the night, desirous of getting some water "to cool the tip of his tongue." His disgust may be imagined when he stepped on to a soaking carpet, and on looking for the cause at his finding that a fellow-student, who lodged in the same house, had come into his bedroom to get some water, and that he was sitting in one corner of the room pouring water out of Hilton's bedroom ewer on to the bottom of a tumbler which he held upside down, while he anathematised his thirst and his inability to quench it.

Hilton was appointed Demonstrator of Anatomy in 1828, the second time this appointment had been made at Guy's. Mr. Cock had been the first, having been appointed in 1825, when the two hospitals were separated. As Hilton was without interest, it is clear that he must have already made his mark to have this appointment given him when he was only twenty-one.[3] The time at which the appointment came to him is of importance, as it was at this time that the Guy's

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[1] This dinner must have been about 1828; it recalls a story related by Dean Ramsay in his 'Reminiscences of Scottish Life and Character,' as coming from Mackenzie, the author of 'The Man of Feeling,' who lived from 1745 to 1831. It shows that the Scotch were as canny in their prevention of apoplexy or suffocation as they were ultra-hospitable in pressing guests to drink. "He had been involved in a regular drinking party. He was keeping as free from the regular excesses as he was able, and as he marked companions around him falling victims to the power of drink, he himself dropped off under the table amongst the slain, as a measure of precaution, and lying there, his attention was drawn to a small pair of hands working at his throat. On asking what it was, a voice replied, 'Sir, I'm the lad that's to louse the neckcloths.'"

[2] One of the earliest of the scientific, or, as they have been called, physiological surgeons, author of an 'Inquiry into the Process of Nature in repairing Injuries of the Intestines, illustrating the Treatment of Penetrating Wounds and Strangulated Hernia,' 1812, and 'Inquiries concerning Constitutional Irritation and the Pathology of the Nervous System,' 1826 and 1835.

[3] I think it may be taken as a fact that Hilton was the first of those appointed in our School or on the Surgical Staff without having been first apprenticed to one of the Surgeons.

Medical School was in its infancy, having been opened in 1825, the final rupture between us and St. Thomas's taking place in 1836. In 1832 the Anatomical Act came into force and replaced the business of the body-snatchers, and during these years there was a third and popular school in the Borough, Grainger's, competing with Guy's and St. Thomas's. The above must have combined to make these exciting times. How differences sprang up between Guy's and St. Thomas's about 1824, how a medical school was first started, independently, at Guy's in 1825, and how the tie between the united Borough hospitals was finally broken in 1836,—all this is well told in the life of Sir A. Cooper by his nephew Bransby (vol. ii), in the memorials of Mr. South, and by Dr. Wilks in his 'Biographical History of Guy's Hospital.' It was a happy storm which cleared the air and started our school on its own lines, with Mr. Cock as the first demonstrator in 1825, and Mr. Hilton associated with him three years later. Mr. Hilton was at this time living in Maze Pond, and if, as sometimes happened, a body was brought after the hours when the dissecting room was closed, it was placed in the cellar of the house that Hilton was occupying.

Hilton was Demonstrator for fourteen years, and was reported to be the best anatomist in London.[1] It was these years which laid the foundation on which his name will rest. The dissecting room of that day now forms part of our Museum. The Demonstrator of those times must have been more important in some ways than at the present. There was none of that profusion of well-illustrated books at the disposal of all, at moderate prices. There was but one examination at the end of the three years, at which Anatomy had to be taken up with other subjects. Anatomy in 1828 occupied an infinitely more important position in the early training of a medical student than it does now. An attempt had only just been made, and very imperfectly, to separate it from Physiology. This blending of the two subjects showed itself in the basis of very sound if very simple Physiology which runs through all Hilton's teaching. It was natural under the circumstances that it should first appear in his earlier anatomical teaching; it was constantly

[1] Dr. Pye-Smith.

coming out, later on, in his surgical work, both in the wards and in his lectures, unpublished as well as published. It is not going too far to say that it is in this sound blending of Anatomy and Physiology, coupled with the natural powers of the man, that the chief merit of Hilton's teaching lies. It is on this that his imperishable claim to be remembered as a great scientific or physiological surgeon rests, strange as it may appear to many who only remember Hilton's outer man to hear the term scientific applied to him, and still more so, to those who have been trained in the physiology of 1893, to hear Hilton called physiological. We shall return to this matter later. We have alluded to it here because some of the chief colouring and the chief characteristics of Hilton's teaching date to the years with which we are dealing, and the relation which Anatomy occupied to Physiology in the year 1828. Hilton, in his earlier years in the dissecting room certainly, worked at Anatomy as no one at Guy's has ever worked either before his day or since; and the chief result is to be seen in the models with which his name and those of Towne the artist and Harrison the treasurer should always be associated. Hilton is said to have lived about the place all day, taking his lunch in a room which should correspond to the present prosector's room. It was this devotion to his subject which won him the agnomen of "Anatomical John."[1]

He must have been thoroughly at home with his subject, having it at his fingers' ends; a teacher in whom, having confidence in himself and his knowledge of the subject, students had entire confidence in all he said, as one who was teaching them that kind of Anatomy which would be useful to them hereafter in the practice of their profession. The work of Demonstrator and of students alike must have been easier in that day. There was much less competition between hospitals and their schools. There were far fewer lectures and demonstrations, and thus teachers and students alike had more time and more energy to give to that which lay before them; each man worked more on his own lines, and less by rules laid down by Universities and Colleges. Students in qualifying for the examination of that day had to rely more on their own exertion, and to obtain their knowledge more by exercising their own efforts, instead of relying upon their teachers to give them just what was wanted in neatly made sandwiches or as spoon-meat which required no mental mastition. If when the time of examination came a man suffered shipwreck in those days, it was on the long-known coast of Little Knowledge, and not on the more recent quicksands of Over-Cram.

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[1] Dr. Pavy.

The event which should fix clearly in the minds of Guy's men 1828 as the year of Hilton's appointment as Demonstrator of Anatomy was the arrival in London about this time of one who was destined to do work with Hilton which, while proving of infinite service to generation after generation of our students, has, in the lapse of years, been too much separated from the names of the three men to whom we owe it. It was in 1826 that young Towne came to London from Royston with his model of a human skeleton, called upon, and was kindly received by Mr., afterwards Sir, A. Cooper, who was so pleased with the accuracy that he gave him a letter of introduction to Mr. Harrison, the Treasurer. This man, to whom Guy's owes so much, who succeeded his father as Treasurer at the early age of twenty-six, who founded a separate medical school at Guy's; who, because he was in some ways despotic and arbitrary, was called "King Harrison," but to whose zeal and interest in the working of every detail in our school its earliest successes were largely due;—this man, who, by sheer power of judging merit, appointed three of those whose names will confer most abiding lustre on Guy's in the future—Addison, Hilton, and Gull—to Harrison's memory students of the present day should turn in reverence, respect, and gratitude for this also, that he, by his power of judging men, and by his foresight and knowledge of what would benefit our school—a knowledge in which he must have been immensely in advance of his day—gave us also those models in the possession of which our Museum has been without a rival, and the envy of other schools. What arrangement passed between Mr. Harrison—who had then been Treasurer for twenty-nine years, and who was not to retire until 1848, after a reign of fifty-one years—and Joseph Towne (who, then only seventeen years old, was to work for our hospital for fifty-three years) will never be known. It was a day of an absolute despotism, which held its sway, on the whole most usefully, regardless of the modern checks which the institution of auditors has given. Mr. Bryant, in his notice of Mr. Towne in our Reports for 1882, writes, "All Towne bargained for was a room to himself, on which he could turn a key when he liked, and the promise of every kind of help from Mr. Harrison, should help be required, in the unknown work he had undertaken to originate." Later on an arrangement was made by which his salary was paid partly by the Hospital, partly by the School—an arrangement which lasted up to 1853, after which date until his death in 1879 the school paid it all. Amongst his earlier models are his best, the anatomical ones which represent the first attempt made in this country to represent the different regions of the human body by wax, and amongst the first of these to be undertaken was the series of thirty sections to illustrate all the parts of the brain. Then followed the models made from dissections, and, as in the case of those just mentioned, by the hand of John Hilton. Before this time, owing to the difficulty of obtaining subjects for dissection, wax models had been introduced into England from Florence and Paris, some of which can still be seen in Museums in London and at the older Universities. Some familiarity with these foreign models is necessary in order to estimate rightly the value of those with which the wisdom of Harrison and the labour of Hilton and Towne have enriched our school. In the models of foreign artists it is comparatively little that is attempted to be shown, the different structures are very poorly defined, the skill of the anatomist to show and the power of the artist to represent are alike at fault; while the perishable nature of the materials used, and the tendency of the tints to become faded and blurred become increased as time goes on. On the other hand, it is difficult to know which to praise most in the handiwork of Towne—their life-like accuracy, their pains-taking determination to represent details faithfully, the truthful sharpness of outline by which the different structures represented are separated one from the other, and, perhaps, above all, the abiding permanence of the colour and materials employed.

No one will ever know now how these marvellous models were made. Not only did Towne's skill and proficiency die with him, not only was his power—the peculiarity of a true artist of fixing in wax or marble what he had once seen in life or death—lost when he departed, but, unfortunately for our profession, he left behind him no account of the improvements he introduced into the materials and colours which he used, and more particularly how he perfected the permanence of our wax models. This was largely due to his solitary habits and love of working alone. One of the conditions which he made with Mr. Harrison was, as we have seen, that he should have a room which he could keep locked. This room was in earlier days one that became later the old Materia Medica museum. Later on it was one attached to the Clinical buildings. In either case all that men saw was Towne coming or going, and an old red-capped assistant that looked like an Italian. The way in which Hilton did his share of the work was to devote an hour or two every day to dissecting with the minutest care a very small part—merely one or two inches[1]—of some region on which he was engaged. He then left, and Towne with like accuracy and faithfulness copied those dissections. When it is remembered that this rule was carried on daily all the year round, in days before the present modes of injection and preservation had come into vogue, it speaks volumes for the energy and perseverance of the fellow-labourers.

During the later years in which Hilton was Demonstrator of Anatomy he was also associated with Mr. King in making the post-mortem examinations, and in giving demonstrations in Morbid Anatomy. This part of the field at Guy's has been so long occupied by a series of distinguished physicians, that it is interesting to remember, now, how Hilton's tenure of the post influenced his life's work. It is seen in the care with which he unravelled the course of the cerebro-spinal fluid, investigated the causation of hydrocephalus in children, and traced it in many cases to closure of the cerebro-spinal aperture in the roof of the fourth ventricle. The same

[1] Mr. Birkett.

familiarity with necropsies and the desire to search out the truth which they alone give is shown repeatedly in Hilton's 'Rest and Pain,' in his account of injuries to the head, his explanation of sudden death which sometimes follows on disease of the upper cervical vertebræ; and so it is throughout the book up to the very end, to the very last case with which it closes. It will be remembered that this was a patient whom Hilton saw, once, for the effects of a severe sprain to one ankle which was followed by fatal suppuration between the shaft and the lower epiphysis of the tibia. Hilton's account runs:—"I did not again see this patient alive. Five or six days afterwards he died with what was thought to be typhoid fever. By chance, on the day before the funeral, I heard of his death. I immediately wrote to his relations and obtained permission to make an examination of the leg. I went to the house early on the following morning; the hearse was at the door, so I had only time to unscrew the coffin and examine the leg. The periosteum was separated from the inner, anterior, and posterior part of the lower portion of the tibia by a considerable collection of pus, which was confined in its position by the periosteum." Hilton must have been over fifty-five when he thus posted up to Islington, intent on clearing up a case. Dr. Wilks refers to his meeting Hilton in his younger days at a post-mortem examination in a house not far from the Hospital. "The man who kept the shop had only one leg, and made use of a crutch. His wife had died after an obscure illness, so that the medical man in attendance asked for a post-mortem, and we accompanied him. Hilton found an abscess of the liver, and immediately exclaimed, "This did not come of itself; she has had a blow with that crutch," which he had observed on entering; he then found a broken rib, and it turned out that in all probability Hilton's surmise was correct."[1] It was perhaps owing to Hilton's sharing the work in the post-mortem room that, as the account in our Reports for 1841 runs, "the examination of the body of Sir Astley Cooper in the seventy-third year of his age was made on February 13th, 1841, at nine o'clock in the evening, thirty-two hours after death, by Mr. John Hilton, in the presence of Dr.

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[1] 'Biographical History of Guy's Hospital,' Wilks and Bettany, p. 348.

Chambers, Dr. Bright, Mr. C. A. Key, and Mr. Edward Cock.” It will be remembered that “shortly before his death Sir Astley Cooper expressed a wish that the appearances which should be presented on the inspection of his body might be recorded in the ‘Guy’s Hospital Reports.’ He had particularly alluded to four points, the investigation of which he thought desirable,—a cured oblique inguinal hernia; a cured umbilical hernia; some suspected indications of phthisis in his youth, and an inability to sleep while lying on his left side.”

In 1845 or 1846 Hilton was made Lecturer on Anatomy, an appointment which he held till 1853. Anatomy lectures at this time were given six days a week, and at two in the afternoon. Anatomy had not long been separated from Physiology, Sir William Gull being, we believe, the first lecturer appointed separately for Physiology at Guy’s. Sir B. Brodie had written largely on subjects which would now be called physiological. Sir J. Paget was lecturing on physiology. It was probably this fact, that the two subjects had not been long divided and placed separately in the hand of physicians and surgeons, that led on Hilton more and more to take the line of Teleology in his lectures on Anatomy, and many other points combined to lead him in the same direction. Teleology at that time, and for long after, strengthened by the publication of the Bridgewater Treatises, reigned supreme in the London hospital schools. At Edinburgh, Knox was in the habit of delivering, as part of his course, lectures on comparative anatomy and ethnology, and had been eloquent, though superficially so, on transcendental or philosophical anatomy; but this most famous teacher, owing to his having received bodies from the murderers Burke and Hare, within a few hours of the murders had been exposed to the risk of Jedart justice, and though exonerated by the confession of Burke and the investigations of a committee, had, after a series of brilliant successes, like his idol, met with his Moscow and Waterloo, and his unique position in the extra-mural School at Edinburgh had been taken by Professor Goodsir as University Professor.

On the subject of Hilton as a teacher of Teleology in Anatomy we may quote from an article unsigned, but certainly by Dr. Moxon, in the 'Guy's Hospital Gazette' for December, 1878: "With Mr. Hilton, the things he saw became matters of living knowledge, for he was always upon the question, 'Why is this thing so? What is the end or purpose which it serves?' His was not the modern question, 'How has it arisen? by what correlation of conserved purposes in vast lapse of time did it evolve itself out of nothing particular?'—a question which rots young surgeons. Hence his power as a surgical teacher: hence he was not drawn aside into vapid 'biology.' He never showed the least taint of troglodyte philosophy, the amateur professorship of which seems now to be epizootic amongst the very highest classes. To him anatomy revealed designs and objects which he could further in his surgical efforts, not casual adaptations of a blind and brainless universe, begetting correlated brainlessness in the curiosity-mongers who collect a row of other specimens to link with themselves into a chain of being downwards, and to resolve into primeval mud the mystery of human existence. Mr. Hilton never lent his powers to this noble achievement."

Hilton, as a lecturer, had the art of saying things which had never been said before, the great secret of interesting students, putting the trite and oft-told facts of Anatomy in a totally new light. Words from his lips, "You perceive, gentlemen," or "You observe," as he pointed to some detail in the relations of the sphenoid, some point in the distribution of the branches of the subclavian, or in the origin or ending of the vagus, was sure to be emphasised by some original remark, not couched in any brilliantly flashing words, but in sober, blunt English, and based on his own observation and his own experience.

To those who knew not Mr. Hilton, to whom his name is but a name, the following passages will serve to prove how habitually he made dull and matter-of-fact details interesting, and how fascinating his Anatomical Lectures were. They will, further, give proof of his precision, his thoughtfulness, and how, as day by day he stood in the Anatomical Theatre, he threw floods of light upon his subject, and how, in his hands, facts which with other teachers would have worn a monotonous Dryasdust aspect became welcome and specially instructive lessons.

It is part of his course on the arteries, and he is alluding to the great precision which marks the supply of arterial blood to some parts of the body. He asks, "Why should not the whole of the rectum be supplied with blood from the inferior mesenteric artery? At first thought, there appears to be no reason why that artery should not carry the blood downwards to all the lower part of the rectum, as well as to the upper; yet it is not so. The lowest part receives its arterial supply almost exclusively from the pudic artery. A few branches may be traced from the inferior mesenteric and middle sacral to join the pudic, but the chief supply is derived from the pudic arteries, which thus bring the neck of the bladder, the perinæum, and the urethra into *intimate structural association* with the rectum. As I think this kind of definite distribution of arteries is a point not sufficiently dwelt upon, allow me to remind you of a few illustrative instances observed in the human body. Take, for instance, the cœliac artery, which is distributed to the organs of digestion, and nothing else. It supplies the liver, stomach, pancreas, spleen, and part of the duodenum; that is all that it does. As these are all organs connected with the process of digestion, the cœliac artery might well be called the "digestive artery." Take another illustration. The os hyoides, placed between the larynx and the pharynx, is, functionally and structurally, associated with both. Does not anatomy tell us that the os hyoides receives a branch from the superior thyroid artery, and a branch from the lingual artery on each side? Is not the os hyoides connected with the functional and structural integrity of both the larynx and the tongue, intimating the reason of the double source of arterial blood for its growth and nutrition? There is a disposition on the part of anatomists to think and to teach that nerves are distributed with designed accuracy, but that there is very little design in the distribution of the arteries. I opened up this subject many years ago, when endeavouring to explain to the students of Guy's Hospital the purpose of the division of the subclavian artery into its numerous branches. I pointed out that the branches distributed from the subclavian trunk, apart from its continuation to the upper extremity, are distributed with one simple purpose, viz. to supply all the parts concerned directly and indirectly in the process of respiration—that is the simple object of the distribution of the subclavian artery. Thus the vertebral, besides supplying other parts, is distributed to that portion of the spinal marrow from which the phrenic, spinal accessory, and posterior thoracic—all important nerves of respiration—take origin.

The internal mammary supplies the sternum, cartilages of the ribs, origin of the pectoralis major, phrenic nerve, diaphragm, and the upper half of the respiratory portion of the abdominal muscles.

The superior intercostal artery goes to the first and second ribs. Now the first is the most important of all the ribs in the respiratory function, as it forms the fixed point for the action of the intercostal muscles in elevating the chest.

Of the branches of the thyroid axis, the inferior thyroid builds up the trachea, a tube essentially connected with respiration, and sends a branch upwards (ascending cervical) which supplies and nourishes the phrenic nerve, and constitutes, in fact, an ascending comes nervi phrenici. The transverse cervical supplies the trapezius and the posterior border of the scapula, with the muscles attached to it, all of which may be considered accessory to respiration. The supra-scapular supplies the clavicle and scapula, both of which are rendered respiratory by the attachment they give to accessory respiratory muscles."

Even a better instance of Mr. Hilton's ingenious way of reasoning from anatomical facts, and finding a purpose in every point of detail, even a clearer example of Hilton's way of looking upon Anatomy not as a heap of facts more or less isolated and detached, but as teaching, each and every one, most important object-lessons will be found in the way in which he lectured on the internal maxillary, or, as he called it, the true "masticatory artery." He is speaking of its branches, and first of the middle meningeal and its course to the interior of the skull. "If it were only for the sake of a supply of a certain quantity of blood to the dura mater, the special intra-cranial arteries; viz. the two internal carotids and the two vertebrals, would be amply sufficient for this purpose, and there would be no necessity for the entrance of those streams that are derived from vessels supplying parts on the exterior of the skull. There must, therefore, be some design in such an arrangement. The essential purpose of the internal maxillary artery is to build up or nourish those parts directly necessary or accessory to the process of mastication, so that it may be fairly called the "masticatory artery." From this trunk is derived the middle meningeal artery, which, whilst ramifying on the dura mater, gives branches outwards, that supply the squamous portions of the temporal, the greater wing of the sphenoid, the frontal and the parietal bones—those bones, in fact, which contribute to form the temporal fossa, the chief origin of the temporal muscle, one of the most important agents in mastication. The middle meningeal artery, therefore, may be said to be sent by the internal maxillary into the interior of the cranium to build up, and afterwards to nourish that portion of its extent which, in giving attachment to masticatory muscles, is rendered subservient to the masticatory function. So fully, indeed, is this intention carried out, that a small artery given off from the middle meningeal, or the trunk of the internal maxillary itself, enters the cranium by the foramen ovale apparently for the express purpose of furnishing nutritive material to the third division of the fifth—the nerve that supplies the muscles of mastication. Now although the intra-cranial portion of the third section of the fifth is situated in such close proximity to the entrance of the internal carotid into the skull, yet it is not supplied by this vessel, but, as we observe, receives a distinct offset from the masticatory trunk, so that its nutrition may be maintained in the closest possible relation with that of the other structures administering to the same function."

His Lectures on the Cranium, some notes on which were reported by Dr. Pavy, and thus fortunately preserved, show Hilton's power of making "dry bones live." It is much to be regretted that other parts of his course have not been thus handed down to us by equally careful listeners.

Hilton's description of the ridges and elevations of the inner aspect of the cranium—their thickness, to enable them better to conduct vibrations—their course, curved so as to weaken those vibrations, and definitely directed to certain points in the base, such as the clinoid processes, whence they are transmitted to the adjacent cerebro-spinal fluid, or lost in the membranous texture of the dura mater, where they terminate without injury to the easily lacerable cerebral tissue, these passages are well known. We will quote one other, which proves how, even in ossification, that *bête noir* of a student, in Hilton's hands, and in his reflective, sagacious mind, complexities that seem merely vexatious, details that appear meaningless, are all shown to have a meaning, and to influence, most advantageously, the organs with which they are connected.

He takes as his text the development of the sphenoid, and the numerous and intricate changes in the direction and arrangement of the whole cranial and facial bones which its growth and final completion brings about.

"The sphenoid bone forms the centre, around which all the other bones, both of the cranium and the face, are developed. It is truly and literally, indeed, a wedge, as its name implies; and thus impacted or wedged in amongst all the other cranial and facial bones, its progressive development spreading its different processes out in all directions, plays a most important part, not only in determining the adult configuration of the skull, but in adapting the final conformation of the organs of the face to the increasing perfection of their associated functions. The mouth, nose, orbit, and pharynx are all more or less directly influenced, and contemporaneously rendered more perfect in form, by the complete development of this bone. All those harmonious changes, also, which accommodate the framework of the masticating apparatus to the increasing number and size of the teeth,—all these, I say, are brought about in a manner I shall presently point out by the progressive development of this bone. By the student the sphenoid bone is regarded as the most complex bone of the body; and precisely in proportion to the anatomical complexity it presents are the variety and importance of its functional or physiological connections.

"The primary intention of the development of the sphenoid seems to be chiefly with reference to the masticatory function, but in the changes that it produces in the direction of the cranial and facial bones it may not unaptly be compared to the scaphoid bones of the carpus and tarsus, for in its growth and final development it effects for the cranium and face precisely the same object that these bones effect for the hand and foot.

"The scaphoid is the last of the tarsal bones to become ossified, and in its growth it not only widens or spreads out the foot, but lengthens the ankle, and increasing its elasticity, thus completes the efficiency of the whole as an organ of support and locomotion. So, again, the scaphoid of the hand, with the trapezium and trapezoid, forms the latest of the carpal bones to be ossified and completed, with the exception of the pisiform bone, that seems to act rather as a mechanical defence to the ulnar nerve and artery than to be developed like the other carpal bones in relation to the movements of the hand. During early life, the thumb is as nearly as possible parallel to or on a level with the fingers; but, as age advances, and the development of these carpal bones proceeds on towards completion, the thumb is pushed forwards and outwards so as to be placed more opposite the fingers, thus materially increasing the efficiency of the hand as a prehensile organ, and adapting it for those delicate and varied operations for which it is destined in the adult human subject.

"The striking alteration in the direction of the petrous bones, which is in wise harmony with changes taking place in other parts, is effected by the full expansion or complete development of the spinous processes of the sphenoid. As the petrous bones enlarge, each spreading out in all directions from its own centre, the two would necessarily have a tendency to approach each in the median line, and thus to crush the intervening body of the sphenoid if they retained their original direction. But at the same time that the petrous bones are elongating the spinous processes of the sphenoid are growing and proceeding in a backward direction, and, being inserted into the receding angle between the squamous and petrous bones, they push the whole temporals backwards and alter the direction of their petrous portions, which, now running more obliquely forwards, can find space for elongating without encroaching upon the central parts of the base.

"Besides altering the direction of the petrous bones the development of the spinous process of the sphenoid, fitting in between the squamous and the petrous, or the masticating and auditory portions of the temporal, acts on both alike, and pushes the whole bone backwards and outwards, thus giving much increased space for the full expansion of the frame-work administering to the masticatory function. It is to the temporal bones that the glenoid fossæ belong, and these articulate with the condyles of the lower jaw. The temporal bones, therefore, in being impelled backwards and outwards, carry with them the glenoid cavities, and in this way not only give a greater area laterally to the pharynx, but also increase the capacity of the mouth both laterally and in an antero-posterior direction. The object of such additional capacity is sufficiently clear, viz. to supply the necessary space required for the increasing size and number of the teeth. We thus see how the changes effected by the evolution of the spinous processes of the sphenoid forms one of the illustrations of the relation that the development of this bone bears to the perfection or completion of the masticatory apparatus.

"The temporal bone, on being thrust backwards, carries with it the parietal which overlaps the portion of the brain associated with the mental faculties, which, like the sphenoid (the bone that effects this change), is late in arriving at a complete state of evolution or development. The union between the temporal and parietal is exceedingly secure; the one bone being, as it were, locked into the other by an alternate overlapping or bevelling of their opposed surfaces of contact. Were it not for such a provision of security, the temporal bone, on being thrust backwards, through the agency of the spinous process of the sphenoid, would glide underneath or be displaced from the parietal, instead of carrying this bone backwards with it."

It is difficult to make selections where all is so excellent. One more extract must suffice to show Hilton's characteristic way of dealing with a bone, taking it point by point, finding in each detail an opportunity for throwing one more ray of light, and finally, when the description was completed and perfected, leaving his hearers with the feeling that Anatomy had never been made so interesting as it was at Guy's at that day.

"The vomer is a flat plate of bone which occupies a median vertical position in the nasal cavity, and which, through the influence of the sphenoid, is mainly conducive in determining the final configuration of the nose and mouth. By its inferior border it articulates with the upper surface of the hard palate, while its superior border is adapted for the reception of the rostrum and the azygos process projecting from the under surface of the body of the sphenoid, which, thus fitting into the vomer, forms an exceedingly secure and efficient articulation between these bones. From this anatomical relation we can perceive how the development of the body of the sphenoid, expanding into the sphenoidal cells and spreading out in all directions, is capable of exerting an influence through the medium of the rostrum which ploughs the vomer onwards in a downward and forward direction, and so alters the relative position of the neighbouring parts, in anticipation of those higher functional attainments acquired with adult age. The inferior border of the vomer being firmly affixed to the hard palate, its advance necessarily has a tendency to push the superior maxillary bones in a direction downwards and forwards, so as to increase the capacity of the mouth from before to behind, thereby giving room for the development of the molar teeth, and at the same time to deepen the cavities of the nasal fossæ, in this way affording space not only for the complete development of the turbinated bones and the extension of the olfactory surface, but also for the more ready ingress and egress of air through the nasal organ. By its connection, anteriorly, with the central lamella of the ethmoid, its advance also pushes forward this plate of bone, which in its turn elevates the nasal bones, and likewise leads to the formation of the frontal sinuses"—*i. e.* by the advance of the anterior table of the frontal bone, with which the nasal bones are connected.

But it was probably in Hilton's Anatomical Lectures on the nervous system that his naturally great, though somewhat rough acumen, his shrewdness as a thinker, his great good sense, and his habit of submitting what he taught to the test of experience were, one and all, most brilliantly conspicuous. In his descriptions of the brain and spinal cord he was a head and shoulders in advance of other writers. Far from being content with giving his hearers mere topographical details, he strove to fit every point by some practical application, or some original, thoughtful, and suggestive view of his own; and if his theories were sometimes fanciful and speculative, they were always ingenious and stamped with originality. Vast as have been the advances of late years in this field, Hilton's truly scientific spirit led up to the point on which we stand at the present day.

The cerebro-spinal fluid is an excellent instance of Hilton's method of throwing new light upon everything he touched on. Instead of dismissing it with a few words as to its chemical and physical character, he devoted a whole lecture to it. While lecturing on Anatomy in 1844, he had had his attention drawn to hydrocephalus, and had found in nearly every case that the cerebro-spinal aperture between the fourth ventricle and the spinal subarachnoid space was completely occluded by dense membrane. The following is a good example of Hilton's keenness to recognise the importance of anatomical and pathological facts, his ingenious way of piecing them together and reasoning from them, and his application of these facts to daily practice:

"I said previously that I should be prepared to detail another case of occlusion of the cerebro-spinal aperture of considerable interest. The gentleman who was the subject of this disease died at the age of thirty-four. On the day of his death he had visited the Crystal Palace. He had been seized with vomiting in the morning, and again about two hours before he reached home. He walked from the Crystal Palace (a mile or so), and when he entered the house he staggered, and said he felt giddy and oppressed. He was placed on a bed, and cold was applied to his forehead; but he died in a very short time, with stertorous breathing. I examined the body, assisted by Dr. Wilks, and this is the report of the post-mortem examination:—'Cadaveric decomposition was advanced, except within the brain, which presented in this respect a remarkable contrast to the other parts of the body. The convolutions of the cerebrum were large, and their surfaces flattened by pressure from within.'

"These convolutions were few, suggesting, perhaps, that the condition of the brain was a persistent state of a very early development of the convolutions; for although the person was full grown, and thirty-four years of age, the convolutions were large and few.

"The brain structure was healthy, neither it nor the membranes containing any tubercular deposit. On carefully opening the lateral ventricles, they were found to contain at least four ounces of clear cerebro-spinal fluid.

"Regarding the character of this fluid there can be no doubt. It was carefully examined. The ventricles were greatly enlarged, and all the receding and projecting angles of the boundaries and cornua were lost or subdued. The foramina of Monro were rounded, and capable of admitting a large quill, not quite a third of an inch in diameter. The fourth ventricle was greatly dilated in all its directions, showing well its lateral cornua, which support the pneumogastric, auditory, and other accompanying nerves. The cerebro-spinal opening between the under surface of the cerebellum and the upper surface of the medulla oblongata was completely closed by a tolerably dense membranous structure, which formed a kind of pouch, projecting downwards, and showed the direction of the fluid tension upon it to have been from above to below. This was clearly seen when looked at either from the ventricular aspect, or below, from the spinal aspect.

"The details of the history during life present an apparently perfect fitting in of the symptoms to the pathological anatomy. But I wish it to be understood that this account has not been 'cooked,' as it is termed. It was not made up for the purpose of agreeing with the facts previously stated, but was drawn up by the brother of the gentleman himself, who is not a professional man. 'This gentleman always had delicate health. The nails of his fingers were peculiar in form, the last phalanges being very short, and the nails inserted like two seeds into the cuticle.'

"I stop at this point to remark that here apparently we have evidence of a congenital error in the development of the fingers, and this inclines me to the conclusion that probably the occlusion of the cerebro-spinal aperture was also congenital.

"As a child he was active and wiry, but very irascible in temper. He had a fondness for intellectual pursuits; also for turning light fancy work, and for gardening; and a great dislike to the excitement, and especially the noise of London. Indeed, at the age of sixteen he had a severe nervous illness with great depression, brought on by application to business in the City; it ought, however, to be mentioned that his occupation was not at all intense, and nothing would have been thought of it by ordinary men.

"Now this is worthy of note, because in this instance there was no possibility of the cerebro-spinal fluid escaping from the interior of the brain. Whatever pressure might be made by mental occupation or physical exertion upon the internal parts of the brain in the medulla would be morbidly manifested, in consequence of there being no possibility of escape of cerebro-spinal fluid, and because there was no aperture to allow of it.

"His food was always of the simplest kind. Even tea, coffee, and cocoa seemed to affect his head and derange his stomach; and he had an instinctive dislike to alcoholic stimulants of every kind. Though subject to coldness of the extremities, he could not bear a warm room, because it made him feel faint. Both winter and cold always affected him injuriously. He said himself he only half lived in the winter; he seemed torpid, and would drop into a deep sleep, from which it was often difficult to rouse him at bedtime, when he seemed scarcely to know where he was. Excitement frequently brought on an impediment in his speech. For many years he was subject to headache, derangement of stomach, and occasional deafness. His pulse was extremely weak, irregular, and slow, from fifty to sixty beats per minute. He was thought to be suffering from heart disease. We have here, if we may so term it, a most important and valuable living experiment. Here is a man who cannot bear any accumulation of blood in his brain, because there is no possibility for the compensatory fluid to escape from the pressure or state of congestion of the organs in the interior of the skull. I conclude that we find the cause of the stomach affection and the deafness in the great distension of the fourth ventricle, and the consequent pressure upon the pneumogastric and auditory nerves on its floor.

"If I were to select this opportunity to enlarge upon the apposite circumstances of this case, perhaps I might do so at too great length. I will merely observe that I think it an important and interesting experiment in reference to the circulation through the brain, the administration of food and stimulants, and various other matters. His brain could bear no fulness of blood, no increase of size, because the cerebro-spinal fluid could not escape from the interior of the brain. He could not take wine, beer, or spirits, and could bear no muscular exertion. The congestion of the brain produced vomiting by pressure upon the medulla oblongata, exerting its influence upon the pneumogastric nerve. He died from pressure upon the medulla oblongata—that pressure which could not be obviated."

On account of our space we must allude more briefly to some of the other more striking points in Hilton's anatomical teaching. It is easy for generations who have arisen since to forget who first it was who, by a wealth of anatomical knowledge garnered by the labours of his earlier years, first placed on a firm foundation facts which seem trite and familiar now.

To take the subject of "The Precision of the Nervous Supply to Muscles," other anatomists, *e. g.* Swan, had published valuable books on the distribution of nerves; it was Hilton who first made Anatomy Lectures interesting as well as valuable by the accuracy with which he traced each nerve, and by the wealth of illustration with which he clenched and drove home every point in their distribution in the memories of those who listened to him.

To use favourite words of Hilton, he used to "put the subject in the plainest practical way" when lecturing on the Nerves of the Scalp. He first drew attention to the importance of distinguishing the different areas according to their nerve-supply, using diagrams far from ornate, brilliantly dauby in colour, but sufficing to him because they illustrated the points on which he was going to dwell. Thus pain at the back of the head and behind the ear might be due to disease of the upper cervical vertebræ affecting the great and small occipital nerves, pain in the lower part of the ear to a suppurating cervical gland lying close to the great auricular; pain in the auditory canal itself to something which concerned the auriculo-temporal nerve.

At another time, in the lectures on the fifth nerve, this distribution of the auriculo-temporal to the meatus of the ear used to lead to the association of earache and toothache, and thus a little later to unilateral furring of the tongue. This was one of Hilton's pet subjects, and one which he claimed as peculiarly his own. In the somewhat sententious *sesquipedalia verba*[1] in which he rather delighted, it was a "functional and unnatural deterioration depending upon nerve influence." In other words, this condition of the fur is one of the effects which disturbance of the nerve-force may produce on the nutrition of a part. Fifty years have gone by since Hilton first had an opportunity of clearing up a case of this kind. It is interesting on another account, as showing the zeal with which he followed up his cases, seeking the information which is given alone in the silence of death. "On December 17th, 1843, I examined with Mr. Blenkarne, a surgeon in the City, the body of one of his patients who had died with disease of the brain and spine. She had suffered from intense pain on the left side of the head. She had also, during her life, a tongue furred on the left and scarcely at all on the right side. It became, therefore, an important point to clear up, what was the probable cause of that condition of the tongue. Upon a very careful examination of the head, on turning up the dura mater from the anterior part of the petrous portion of the left temporal bone, for the especial purpose, we exposed the Gasserian ganglion, or the ganglion of the fifth nerve. We there found what might be called a scrofulous deposit upon the convex edge of this ganglion, involving the second division of the fifth nerve more than the third, but still involving all more or less. Here, then, appeared to us to be the probable explanation of the tongue furred on its left side. In 1844, when delivering some lectures upon the nerves at Guy's Hospital, I mentioned the case, and one other that I had seen before, the cause of which I had not distinctly proved. After the lecture one of the students said, 'Look at my tongue; it is furred on one side, and I cannot get rid of it.' He had a decayed and painful tooth—the second molar in the upper jaw. That tooth was, by my advice, removed, and after a short time the fur on the tongue entirely ceased. Some time afterwards a case of fracture of the skull was brought into Guy's Hospital, where the fracture ran across the foramen rotundum, containing the second division of the fifth nerve. In that case the man had a furred tongue on the same side, indicating a probable relation of cause and effect."

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[1] The "seven-leagued words" of Dr. Rochecliffe in Sir W. Scott's 'Woodstock.'

One of the most observant of living surgeons, and one who, perhaps, more than any other has added to the knowledge of his own and future generations—Mr. Hutchinson—has put forward ('Lond. Hosp. Reports,' vol. iii, p. 392) quite a different explanation of these unilateral furrings of the tongue, viz. that the side of the face which corresponds to the furred half of the tongue is but little used in mastication, and hence no renewal of the epithelium of the tongue takes place by friction of the food on that side. In Mr. Hutchinson's words, "One-sided fur of the tongue is, I believe, caused simply by the circumstance that its subject is accustomed to eat on only one side of his mouth. . . . It is often present where there is mere loss of teeth, no toothache or source of irritation. I therefore cannot agree with the hypothesis which supposes it to depend upon reflex disturbance of nutrition through the lower branch of the fifth. It is quite true that it occurs in its most exaggerated form where there is toothache, but this is precisely the condition in which mastication on the affected side would be most sedulously avoided." In answer to this, while we may point out that there are cases to which, owing to the absence of toothache or any irritation, Mr. Hilton's explanation will not apply, it is quite clear that the one which Mr. Hutchinson would substitute will not account for those cases where, quite apart from toothache, there is a distinct source of irritation, deeply situated within the cranium, as in two of the cases instanced above. Nor will it meet those cases in which the furring of the tongue is not unilateral over the distribution of the lingual gustatory, but limited to the posterior part of the tongue. For Hilton also showed that in certain cases of disease of the tonsil, *e.g.* inflammation, syphilitic ulcer, &c., a region which is supplied by the glosso-pharyngeal nerve, the posterior part only of the tongue (which is supplied by the same nerve) is furred also.

Before we leave Hilton, and the way in which he made the cranial nerves interesting, we may refer to one more instance, not only because it is a fresh example of his power of tracing cause and effect, and throwing light on obscure places, but because with it is linked another name—the name of one greater than Hilton, and one who, in spite of occasional differences, was one of Hilton's most staunch admirers.

"In a preceding lecture I mentioned that a professional friend of mine had suffered from a condition which bears on the subject of the influence of nerves on the structures supplied by them. That friend, unfortunately, is no more. It was Dr. Addison to whom this happened. Some years ago Dr. Addison had a very offensive discharge from one external auditory meatus, which annoyed him very much, and below the ear was a small gland, enlarged. He had tried various remedies, and had gone, I believe, to some surgeon who attends specially to the ear; but, as far as I could learn, no good resulted from any of their applications. Upon examining the ear from which the offensive discharge proceeded, I found a slight ulceration upon the floor of the auditory canal. On discussing the question between us, we came to the conclusion that the ulceration probably depended upon a diseased molar tooth in the lower jaw on the same side. We had that tooth extracted, and in a very short time the ulcer healed, the discharge disappeared from the auditory canal, and as soon as that ulceration was cured the enlarged gland subsided. Here the true cause of error was remotely situated from one of the most prominent symptoms, namely, the enlarged gland in the upper part of the neck. In this respect the case is of great interest."

It was just the same with the nerves in other parts of the body; for every one Hilton had some ingenious suggestion to make, which illustrated from his favourite Teleological point of view some detail in the course or distribution of the nerve, or some case to quote in proof of the importance of a precise and accurate knowledge of Anatomy. To give a few instances:—"As a rule, nerves enter the muscles where they would be most secure from pressure; and it is curious to observe how careful nature has been in this respect to guard one of the most important nerves of the body. The phrenic nerves (our lives hang upon these threads), after passing through the chest, traverse the diaphragm, and distribute their branches upon the under surface of the muscle, and are so situated that they cannot be compressed during respiration. If they were distributed upon the upper surface of the diaphragm, where there is a constant and forced contact between the base of the lung and the superior aspect of the diaphragm, and especially so during a retained inspiration, it is obvious that these filaments of the phrenic nerve would under these circumstances be exposed or subjected to compression, and the action of the diaphragm would be dangerously interfered with. The nerves, however, are distributed upon the under or concave surface of the diaphragm, the whole tendency of gravitation being to remove the liver, the stomach, and the spleen away from them, so as to enable the nerves to carry their influence to the diaphragm unmolested."

The two following cases are classical, though at the present day their explanation seems obvious enough, and with the advances of modern Surgery the cause could in each case have been dealt with. "Elizabeth B—, aged 47, came under my care at Guy's Hospital in February, 1853. She was of healthy aspect and regular habits. About a year before, she felt numbness in the extremities of the third and fourth fingers of the left hand, with pain in the same parts, especially increased during the night. The fingers gradually became enfeebled and lessened in size. In a short time the ends of the above-named fingers began to appear discoloured, while the numbness and pain increased. She had no particular treatment for this, and, as mortification was impending, the surgeon advised her to come to the hospital. On admission the third and fourth fingers were found to be gangrenous. No pulse was perceptible in the radial, and only a very slight one in the ulnar artery. On examining the case to ascertain the cause of all this, I found upon the first rib an exostosis pressing upon the subclavian artery so as to prevent any blood from passing through it. The exostosis was pressing upon a nerve also, which turned out to be the ulnar nerve. I pressed my finger upon the nerve overlying the exostosis, and immediately the patient experienced additional pain in the little and adjoining fingers."

"Some years ago a sailor came to Guy's Hospital under the care of the late Mr. Key, having had a bad fracture of the lower part of the radius. There was no surgeon on board the ship; the fracture was not properly set, and in consequence the callus pressed severely upon the median nerve above the wrist. The man had ulceration of the skin upon the thumb, the forefinger, and the middle finger. The hand was purposely flexed, and all the tension was taken off the median nerve, and the ulceration got perfectly well; but as soon as his hand was allowed to be freely used and extended again, and the pressure of the callus permitted to exert its influence upon the median nerve, the ulceration reappeared. He could not pursue his occupation as a sailor, but it was not thought right to submit him to any remedial operation, which might place his hand in danger; so he preferred remaining as he was, subject no doubt to a recurrence of the ulceration to which I have alluded."

We have mentioned Dr. Addison's name: before leaving Hilton as a Lecturer on Anatomy it may be mentioned that that great physician did his surgical colleague honour in a way which is probably quite unique. For many years, when Hilton reached that part of his course relating to the brain, Addison used to attend,[1] a chair being placed for him just within the door by which the lecturer enters from the

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[1] Dr. Constantine Holman.

Museum. Some have thought that this was partly due to Addison's knowledge of Anatomy being deficient. This is possible. Addison took his degree at Edinburgh in 1815: at this time the Chair of Anatomy was still in the hands of the Monros. Monro (Primus) and his son (Secundus) had passed away after laying firm foundations on which the Anatomical School of Edinburgh was to flourish later; in 1808 the third Monro was beginning his long and somewhat tedious reign, and Barclay had not long begun to show that zeal which was to make him famous as an extra-mural teacher. But the chief excuse, if one were needed, for the most eminent physician of his day wishing to refresh his knowledge of Anatomy lies in the fact that at the time Addison was at Edinburgh the supply of subjects was notoriously unequal to the demand. Owing to the population of the capital being comparatively scanty, and the fame of the Edinburgh school, the demand was so much greater than the supply that Dr. Barclay, in 1806 and later, was sending to London for subjects—a precarious and necessarily costly speculation. Dr. Lonsdale tells us that "the trading smacks plying between London and Leith were often detained by adverse winds, and the boxes of mortalities marked 'perishable goods' seldom reached their destination in a satisfactory condition." So, too, with regard to the other source of transit, that by coach. The art of packing and the use of anything approaching to antiseptics seem to have been utterly wanting. The same authority writes, "The danger of discovery was greater in the towns where the coach stayed for the night. Several inquests were held at Carlisle on bodies thus detected, and meant for the Edinburgh school. The decision of the juries on these occasions—'found dead in a box'—used to amuse the Scottish jurists, and naturally threw discredit on the proceedings of all 'crowners' 'quests.'" If Addison's knowledge of Anatomy was deficient there was abundant excuse, but we suspect that there was another reason. Addison, as we have seen, had been a patient of Hilton's: there was much in this leader of men to make him respect the sagacity, the vigour, and the other sterling qualities of his younger and surgical colleague. If Addison, with his immense reputation, and his position, in Dr. Wilks' words, "as the leading light at Guy's, much superior to what Bright could ever claim, and equal, if not greater than that of Sir Astley Cooper," could thus find it worth his while to attend Hilton's lectures on Anatomy, we can understand how it was that when 2 p.m. came, students of all years were seen flocking to the Anatomical Theatre. Dr. Pavy recalls how on Tuesday and Friday at this hour, when Hilton left the operating Theatre to lecture, the Theatre emptied to follow him.[1]

We turn now from Hilton as an Anatomist and Teacher of Anatomy to his work as Surgeon and Teacher of Surgery. In 1845 he was elected Assistant Surgeon at Guy's. The surgical staff at this time included Morgan, Key, and Bransby Cooper as surgeons, and Callaway, Cook, and Hilton as assistant surgeons. By this time Hilton had had eighteen years' work in the Medical School. There is an impression in the minds of some that Key disliked Hilton, and kept him back. There is probably some truth in this. From 1830 and onwards Key was the first surgeon of the day; and this, together with the fact that in 1824, only three years after his qualifying, and when only thirty years old, Key had been appointed full Surgeon at Guy's, will account for much of his haughty, imperious way, and his habitual self-absorption in the success of his own paths in life. However this may have been, we shall see that Hilton, a little later, could speak very generously of his somewhat arrogant senior. Hilton at once devoted himself to the out-patients. He was well aware that he was behindhand in purely professional knowledge, and this very largely through no fault of his own. During his eighteen years' work at Anatomy and Pathology he had had no care of cases and no opportunity of practical work. At this time, be it remembered, the increasing population of London had not brought about the formation of those smaller hospitals, of which so many exist now, and at which it is possible for juniors to gain valuable experience, while waiting. Hilton's previous work had been almost entirely on purely scientific subjects. And perhaps one other fact should be mentioned if this memoir is to have any of the honesty and straightforwardness which were largely characteristic of its subject. Hilton was not made Assistant Surgeon till 1845. We have seen that the models which we owe to him and to Mr. Towne were finished by 1838. In the years which intervened between the above dates Hilton was, perhaps, a little slack. Some of his early freshness and zeal had passed away with the fruits it bore, for in 1839 he had attained to the high honour of F.R.S. The truth is that certain changes which have taken place in the suburbs will account, in a measure, for any "neglect" of "purely professional work" (Dr. Wilks) for which Hilton himself may have been responsible at that time. He had one or two friends amongst the resident Fellows of that day in Dulwich College. This foundation then consisted of the old three-sided quadrangle, the picture gallery (originally collected for Stanislaus, king of Poland), four resident Fellows, a warden and chaplain; the present Dulwich College School, which did not start in its new buildings until 1870, being represented by Alleyne's original free school. The rising grounds of the surrounding manor, with which every one is familiar, were at that time richly wooded, instead of being thickly studded with villas. Dulwich was an isolated Surrey village, and there is no doubt that Hilton availed himself a good deal of the privileges which his friends at the College would give him of good dinners and rabbit shooting in the woods around.

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[1] It must be remembered that at this time students in their first year, owing to the shortness of the "curriculum," and the much smaller number of lectures, used to attend on the surgical practice of that day.

However this may be, when appointed Assistant Surgeon Hilton must have made up for any lost time. Here, too, the scene as well as the actors have been greatly changed. The New Buildings, or Hunt's House, with its north and south wings, did not exist. Out-patients when Hilton was appointed were seen in a wretched room below ground situated on the east side of the two quadrangles through which the colonnade runs, and, being under ground, reached by a staircase. The part of the old building now occupied by the surgery and dresser's rooms was then the taking-in room, casualty room, and steward's office.

Hilton had not long to wait as Assistant Surgeon; in 1849 his promotion came to him in a somewhat tragic way. On August 22nd of this year Mr. Key was seized with symptoms pointing to cholera while seeing patients at his house, and he died the next morning, after only twenty hours' illness. Hilton's promotion to the vacancy thus made is announced in the 'Lancet' of September 13th.

Two stories have come to us about this event, the one showing how unexpected was the vacancy, the other the outspoken honesty of Hilton's mind.

Dr. Constantine Holman relates that one day, a few weeks before Mr. Key's death, he, in passing along the colonnade, stopped to pay his respects to his old surgeon, and found him in a state of doubt as to whether he should obey a call to Frankfort to see one of the Rothschilds. The fee was 1000 guineas, but, as Key remarked, he never got up from his table in the morning without having taken ten or fifteen guineas, and these patients would not be missed only once, as many of them would come two or three times. "But what if some one else goes, sir?" "Ay, there's the rub." Key went. Hilton at the time was standing in the colonnade, a few paces off. Dr. Holman said in the course of the conversation, "Mr. Hilton has had a long time to wait for his beds." "Yes, and he will have to wait longer still," was the reply. A few weeks later Key was in his grave in St. Dionis' Churchyard, close to the back of his house in St. Helen's Place.

At the first school or staff meeting after the death of Mr. Key, Mr. Dobree, the treasurer (1848—1855), who, like many others, had quarrelled with that most eminent but somewhat dictatorial and arrogant surgeon, simply mentioned his death and his successor, and passed on to other matters. Hilton got up and spoke of the credit which Key had been to the Hospital and School, and then, warming *more suo* at what he considered an injustice, went on to say, "If no more notice than this is to be taken of Mr. Key, all I can say is that it's a d—d shame."[1]

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[1] Dr. Pye-Smith. The ægis of my colleague's name will protect me from any accusation of habitual laxity of speech. Hilton never stopped to pick his words. And we must remember the habits of fifty years ago. Bob Acres had been long before his time—"The Rivals" was first acted in 1775—in his remark, "Damns have had their day." Hilton might have quoted great names as his excuse. Lord Melbourne, Prime Minister for the second time from 1835 to 1841, a gentleman in some of the best senses of the term, and a man whose name will always

Of Hilton as full Surgeon to Guy's we must try and give a sketch of the man first as a teacher in the wards and the theatre, and then as a lecturer on Clinical Surgery. To realise at all his power as a bed-side teacher, and his habit of getting information out of his cases, my junior readers must understand what a change Surgery has undergone since Hilton passed his twenty years as full Surgeon. Professor Lister had not introduced his great discovery, nor had Mr. Howse, as yet, gone to Edinburgh to return with those primitive and primeval implements of the Antiseptic Surgery of that day,—the putty, the irrigation tins, and the carbolic oil, which, introduced by him in 1870, not without much indifference and some ridicule, and constantly tended and fostered in his hands, have gradually developed into the Antiseptic Surgery as we know it at the present day at Guy's. Hilton's wards were Luke, Charity, and Cornelius—and the bedsteads are about all that have undergone no change. Primary union at that time was the exception, not the rule. Suppuration was not to be described (as by the modern ward clerk) "absent," or as "about a drachm in forty-eight hours," or as "a little sour;" but rather in the words of old Blucher when, after his fall in one of the final charges at Ligny, he had been brought round by copious potations of brandy (intended for use as a liniment rather than as a libation), and excused himself on embracing Sir H. Hardinge with the words, "Ich stinke etwas." The principles of drainage were then in their infancy, and but imperfectly carried out. Any ligature securing a vessel was left with its ends long. Dry lint and strapping were the first dress-

be held in honour for the pains which he took to initiate the Queen, when young and inexperienced in the years between her accession and her marriage, in the difficulties of constitutional government, was a notorious offender in this respect. The story runs that the Lord Ossington of that day called on Lord Melbourne with regard to some alterations he wanted made in the new Poor Law Bill. Lord Melbourne referred his visitor to his brother George, Under Secretary at the Home Office, and as much addicted to the use of profane expletives as himself. A few hours later, on their meeting again, the Premier asked Lord Ossington, "How did you get on with my brother?" "Very badly," was the reply. "He d—d me, and he d—d the Bill, and he d—d the paupers." "Well, d—n it," said Lord Melbourne, "what more could he do?" The witty sarcasm with which Sidney Smith rebuked this habit of the Premier is well known.

ings; later on, when suppuration set in, linseed poultices, lead and opium lotion, or a red lotion containing tartrate of steel. For fear of secondary hæmorrhage the flaps of a stump were not closed at once, but left to "glaze," and sutured later on in the wards.

The dressership to Hilton was considered as a Blue Riband.[1] In proof of this it is interesting to note that of our present staff the following were his dressers:—Dr. Pye-Smith, Dr. Taylor, Dr. Goodhart, Dr. Savage, Mr. Durham, Mr. Howse, and Mr. Davies-Colley. "Strong men were powerfully attracted by Hilton as a teacher."[2] Dr. A. Buck, of Ryde, writing of his time at Guy's (1863 to 1868) and his dressership to Hilton, says, "Much in surgery has changed, *toto cœlo*, since those days. I am not aware, however, of anything that Hilton taught me that has not been useful, or that has become obsolete."

This was due to the fact that Hilton taught on broad lines. He disliked names and conventional descriptions; the information he gave was all based on common sense and practical observation. His teaching of thirty years ago would have been equally valuable now-a-days. There was no conjuring of memories for particular theories; no discussion of useless details and possibilities, only to be forgotten at the next bed; and, above all, no fads.

Hilton relied upon his dressers not only for the treatment, but also for the reports of his cases. The ward clerks, not introduced until 1867, were a novelty that he ignored. The dresser was expected to have the report of each new case that fell to him ready by the time Hilton paid his next visit. If the report showed evidence of common sense and painstaking observation, words of satisfaction and occasional praise very likely followed. If the reverse, if there was any uncertainty in the dresser's mind as to what he might have observed, if proper names, obscure or theoretical terms were used, rebuke was certain, generally coupled with sarcasm, and, too often, with a sneer. Thus if, in Cornelius Ward, in answer to the question, "What have you got here, sir?" the dresser answered, "I think it's a Pott's fracture,

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[1] Dr. Pye-Smith.

[2] Dr. Alpheus Buck.

Mr. Hilton," the reply was sure to provoke a storm. Hilton was no respecter of persons. As we have seen, his early education had been faulty, and he had—much too soon to be good for him—been obliged to trust to himself alone. "Vixere fortes ante Agamemnona" was scarcely enough an article of his faith, and the mention of the great St. Bartholomew's surgeon only led to an expression which relegated his name to undeserved obscurity as long as those dressers were in office, while the uncertain tone of the dresser's reply was likely to evoke "Think so! Do you think that you've hair on your head?" As was natural from the bent of his mind, Hilton was always wanting to know why this or that was done, in marked contra-distinction to carrying out any routine treatment. He was most minutely particular as to his cases being dressed properly—a point especially noticeable in his fractures. "Nothing approaching slovenliness escaped his eye, but provoked rebuke mingled with scorn, much dreaded by his dressers. Time after time," writes Dr. Buck, "he made me take down the same fracture, put up, as I thought, with the greatest nicety and care, because the patient complained of some pain, at the heel may be, or because Hilton could detect the line of fracture with his finger."

"That fracture is not in good position, sir; will you tell me why?" often fell from Hilton's lips, followed by questions on the origin and insertion of all the muscles concerned, their nerve-supply and grouping.[1]

It might truly be said of Hilton that he was *magnus in magnis*, and still more that he was *maximus in minimis*. However chronic and uninteresting, however trite and trifling seemed the case, he had the power of getting information out of it.[2] Thus it is told how one day, when he had finished one ward, and was waiting for something, he drew attention to a tedious case of necrosis, and pointed to the fact that the pus which was coming away pulsated.

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[1] Mr. Couling.

[2] Dr. Wilks ('Biographical History of Guy's Hospital,' p. 348) writes, "Medical practitioners, meeting Hilton in consultation, were all agreed that, thoroughly as they thought they understood the case, this surgeon would come in and throw fresh light on it."

Turning to the students nearest to the case, he bade them notice how compression on the artery diminished the pulsation, while it increased when the vein was pressed on.[1]

Much has been said of Hilton's brusque way and rudeness to those with whom he worked—a matter to which we shall refer again.

The following shows that his sarcasm was not always of the cynical and harshly grating kind that it has been represented. We again gladly quote Dr. Buck: "On one occasion, when following him up the grand staircase, I was unconsciously whistling (being light-hearted in those days), when Hilton, suddenly stopping and parting the press of students following, beckoned me forward, saying at the same time, 'The band always goes in front, gentlemen.' On another occasion he noticed a student going round who was somewhat of a dandy, with an ornamental cane in his hand. Hilton, with much affected interest, requested the youth to let him look at the walking-stick. The owner seemed flattered by such notice, until, after looking it over with much minuteness and admiration, Hilton said, 'Pray, sir, what surgical use do you put this to?' At that time it was not unusual for some students to go round the wards in smart gloves. I remember, once, Hilton was examining a man *per rectum*—a case of fistula or malignant disease, may be—and, withdrawing his finger, he with much courtesy invited these elegantly gloved dandies to examine the case. As they, one by one, withdrew to the rear of the crowd, he said, 'Gentlemen, never miss any opportunity of examining the rectum you get; if you do, you will surely live to regret it.' These words impressed me greatly, and I always acted up to them. Some years after they stood me in good stead. I was newly qualified, and acting as *locum tenens* in private practice, when I was sent for to an old gentleman, very irascible and impatient, whose case I could not readily diagnose. He complained of constant tenesmus and pain in defæcation, which had come on suddenly and recently. Nothing was to be seen externally, such as piles, fissure, &c. Suddenly Hilton's words crossed my mind, 'Never miss an opportunity,' &c. I passed my finger, and found about two inches up a large fish-bone jammed transversely across the gut, the removal of which cured the case."

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[1] Dr. Pye-Smith.

It was to a similar kind of dandy, and perhaps about the same time, that a remark of Sir W. Gull referred. It was a Whit Sunday morning, bright with glorious sunshine streaming into the ward, and the physician was paying a Sunday morning visit to urgent cases. He came to a case of enterica, where the patient, in all the apathy of grave illness, lay flooded in a recently passed evacuation. An "exquisite," arrayed in all his Sunday best, drew back lest his outer man should suffer defilement. One of Sir W. Gull's sententious and somewhat mystic aphorisms promptly followed: "God's sunshine, gentlemen, shines alike on the palace and the dunghill."

Hilton's power of sarcasm, dreaded at all times, was on one occasion welcome. If any student had made himself obnoxious to his fellows, these comforted themselves with the thought that when he came under Hilton's hands, whether in the lecture theatre or the wards, retribution would be sure to follow. In the matter of doing prompt justice upon an offender, however, the palm must probably be given to Dr. Oldham.[1] It is said that a student, chiefly renowned for his want of manners, stood up during a midwifery lecture, and turned his back on the lecturer while he spoke to some friend in one of the rows above him. Dr. Oldham was more than equal to the occasion with "If there is one presentation which I detest above all others, it is *a back presentation.*"

For the following I am indebted to Dr. Savage, who, as is well known, was in the habit of giving Hilton back as good as he gave. "The first time I went round as one of his dressers I had a rose in my button-hole. Hilton merely looked at it. The next time I had a bunch of forget-me-nots. He looked, and said, 'Where did you get them?' I replied, 'From the country.' But the next occasion I had got a big thistle in my button-hole. To this Hilton said, 'Where did you get that? from the country too? I wish to goodness you would take half as much trouble about my cases as you do about your flowers.' I said, 'Tell me one of my cases which is not properly dressed.' He laughed, and admitted that he had no ground for complaint.

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[1] Mr. Couling.

"One of his dressers with a long beard asked permission to be absent for ten days. When pressed as to the reason, he owned that it was to go to St. Andrews for the M.D. After some hesitation Hilton said, 'Go, and I hope they will pluck you.' On the dresser's return Hilton said, 'Well, Beardy, did you get through?' 'Yes,' was the reply. 'And did they address you at the Northern Athens as *Hic ornatissimus vir?*'

"One day Hilton came round to find me alone of his dressers at the hospital, the rest being away at a cricket-match or something of the kind. 'Where are the rest of you?' said Hilton. I said, 'Not here.' 'I can see that,' he replied, and set to work to cut all the bandages, complaining of their not being well put on. He then told me to re-apply them before dinner-time. I said I would do as many as I could before, and the rest after. Hilton stormed, but I persisted that that was what I should do, and he became quite pleasant before he left. One Christmas-time, Hilton came round the day before. I happened to have 'taken in' a fortnight previously. He said, 'Where are you going to spend Christmas?' I replied, 'At home.' 'No, you are not,' he said. 'You are going to stop up and look after my cases.' I said I feared I should not; whereupon came the threat, 'I shall come round on Christmas Day and see if you are about.' I told him, 'Then you won't find me.' When Hilton came round next time he asked me if I had enjoyed the day, and was pleased that I had not been fool enough to mind what he said."

We have dwelt at some length on this element in Hilton's life, his brusque bluntness, his ready rebukes, too often sarcastic and irritating, and his too ready betrayal into frequently making jokes at other people's expense—jokes very often grossly personal, and on that account extremely galling. There is no defending or excusing this. Hilton himself, when he was dying, acknowledged this fault, when he felt that it was too late. It will suffice to remark that Hilton's early life, when a man is most impressionable for good or evil, had not been days likely to refine a man or make him considerate of others, and out of these days Hilton had not come unscathed. Very strong in common sense, himself keenly observant and singularly accurate and ingenious in turning his observations into sound practice, he was unsparing at any want of common sense, and prompt to condemn any instance in which a dresser had lost an opportunity of observing for himself, and still more to ridicule any attempt to air a fad, or to quote some unproved and therefore unapproved theory. Too often, in thus condemning and ridiculing, Hilton went too far, and his condemnation and chaff passed into causticity, and his ridicule into rudeness.

But it is fair to add that though much has been heard of the rudeness and the ridicule, too little has been remembered of the approval and the praise which, in a few terse words, Hilton used to bestow on those who showed evidence of painstaking attention to details, shrewdness, and common sense—points which Hilton, being very strong in them himself, was always glad to recognise in others. We have seen, in Dr. Buck's words (p. lxx), that "strong men were powerfully attracted to Hilton as a teacher:" many of them can speak of instances of Hilton's roughness; but whether it is a prosector[1] who, falling asleep after a morning's hard work during the two o'clock lecture, was waked up with a rap on the head with a femur which lay too ready to Hilton's hand; whether it is an old dresser[2] who, giving an anæsthetic in private for Hilton and becoming too interested in the operation, received at the same time a smack on the face and the rebuke, "Just pay attention to the chloroform, and not to me,"—nearly all the victims (for there were many others) speak without bitterness of the stripes meted out to them; for they feel that Hilton's hand, if heavy, was impartial, and that his readiness with rebuke was intended for the student's good.

As an operator Hilton was most careful and attentive to details, but in no way distinguished for expertness or skill, or brilliancy in operating. To quote Dr. Buck again, "As an operator Hilton never played to the gallery. He was painstaking and particular, finishing off all carefully, so that it was not often that his cases had to be taken down for secondary hæmorrhage, pain, &c." The bent of Hilton's mind, prone to watch and to observe, and to reason over his observations, was to delay resorting to the knife—a bent no doubt increased by the fact that he had begun his work in days before the introduction of anæsthetics. Hilton had seen that the great rapidity of work which was so necessary in those days had another, and, occasionally, a tragic side. He had, perhaps, been present, with the father of one of the most justly esteemed of the senior students now with us, when the deft hands of Aston Key, during lithotomy, an operation peculiarly his own, perforated the bladder.

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[1] Dr. Constantine Holman.

[2] Mr. Couling.

Dr. Wilks, in his most interesting account of Key and Morgan, speaks of the brilliancy of the one and the skilfulness of the other as operators ('History of Guy's Hospital,' p. 337). Dr. Constantine Holman tells me that this rivalry was sometimes amusingly shown. Morgan and Key had each a case for lithotomy on one operating day. On Morgan's entering the theatre one of his dressers told him Mr. Key had just cut a boy in so many seconds. "Has he?" said Morgan, "d—d if I don't beat him;" and he did so on that day—by four seconds.

The very exactness of Hilton's anatomical knowledge helped to make him cautious, as is shown by the method of opening deep abscesses on which he laid such stress, and which still goes by his name. But that the same anatomical knowledge could make Hilton bold when boldness was required, is shown by his being one of the earliest surgeons to practise lumbar colotomy. Vol. xiii of these Reports (1867) contains a case of intestinal obstruction in which colotomy was performed, and twice repeated.

Nearly twenty years before, Hilton, while Assistant Surgeon, had, in January, 1848, operated on and reduced by abdominal section a case of obturator hernia which was simulating intestinal obstruction. The lady sank from acute peritonitis, and the specimen, a very valuable one, the relations of the parts having been dissected by Hilton himself, is in our Museum.

In 1846 Hilton had performed what he believed to be the first recorded instance of any surgeon in this country having succeeded in his attempts to relieve an internal strangulation of the intestine by operation. This case was an extremely interesting one. The patient was a gentleman aged 21, whom Dr. Golding-Bird had seen in consultation, diagnosing strangulation of a loop of small intestine in the right iliac region, not far from the ileo-cæcal valve. This diagnosis was verified later when Hilton operated, and set free a loop of ileum, about six inches long, strangulated in an opening formed by a loop of small intestine, in its turn tied down to the brim of the pelvis by old adhesions, which probably dated from an attack of peritonitis originating "in mesenteric disease" when the patient was three years old. Here, too, the patient sank from acute peritonitis. When it is remembered that abdominal section was performed here without the aid of any anæsthetic—that, owing to the distension of the abdomen (the operation was performed on the fifteenth day of the illness), a prolonged search was required to find the strangulated portion of intestine—that in spite of all these difficulties Hilton succeeded in finding and in completely relieving the obstruction,—we, who operate with all the advantages of the close of the nineteenth century, will do well to remember Hilton's name with respect as one of the earliest pioneers in abdominal section for intestinal obstruction, under difficulties such as we shall never know.

Both these cases are recorded in the 'Medico-Chirurgical Transactions,' vols. xxx and xxxi. Each is illustrated with an excellent woodcut, Hilton having, *more suo,* made a necropsy himself in each case.

No account of Hilton would be complete without allusion to his Clinical Lectures. It was probably here that he was seen at his very best. In the first place he had an excellent report taken by a dresser, and to this report Hilton had given hours and hours of quiet thought and consideration. Only those who had to go to 10, New Broad Street, at what may be called odd times, realised how Hilton studied his cases.

It will be long before any teacher arises who has equal power of bringing out the importance of every detail in a case, and of linking together, as he went along, a series of facts in the clinical report till they formed a continuous chain which kept the idlest student interested throughout the hour.

Happily a generation which knows not Hilton can still realise how he taught. Some of his clinical lectures will be found published in our Reports (vols. xi and xiii) for 1865 and 1867. A few were also published in the *Lancet*.

It is much to be desired that every Surgical Ward Clerk should read these Lectures before commencing his appointment. As we have stated above, Hilton always relied upon his dressers for the report of the case. When it is seen that one of these reports is drawn up by Mr. Howse, another by Mr. H. Morris, and that two of the series of lectures were arranged for publication by the Surgical Registrar of that day, Mr. G. Eastes, the excellence of the material which Hilton had ready to his hand to lecture upon will be recognised. The following well expresses Hilton's plan and object:—"I entertain the opinion that the best plan to pursue in a clinical lecture is to take up one case, to enter fully into all the details of the symptoms and treatment of it, and to explain to you to the best of my ability the why and the wherefore of everything associated with that single case. I consider my analytical plan to be productive of the greatest benefit to you, gentlemen, by inducing you to habitually examine and interpret every symptom presenting itself to your notice."

One of the most interesting lectures is the first in vol. xiii of these Reports, and headed "*Fatal case of rupture of left kidney, attended with hæmaturia. Remarks on clots of blood as aids to diagnosis.*" The man had been struck by the buffer of an engine in the abdomen, and, when he died on the twenty-sixth day, the left kidney was found to be ruptured. We will make a few extracts most characteristic of Hilton. "He breathed freely; in other words, he could, and did, use his diaphragm without inconvenience. . . The patient, however, could not cough. For this functional act the muscles of the abdominal parietes are used, and the patient's inability to cough was due to the fact that these muscles were bruised. You must not ignore small points like these. Upon them the diagnosis of a case frequently depends."

"Later on, in the second day, the patient had inability to void his urine; why so? It might at first be from his position; for, when placed in bed on his back, a man often cannot easily pass his urine. Moreover the region in which the injury had been inflicted doubtless exercised much influence; for we find the bladder and urethra usually sympathise in various ways with kidney trouble, sympathetic spasm of the bladder being thus one of the most frequent concomitants of stone in the pelvis of the kidney. Moreover the abdominal muscles were partly paralysed from injury. Lastly, the bladder, recognising the fact of blood being in its interior, would telegraph to that effect to the urethral muscles, and the course of the urine would be arrested by spasm of the urethra."

"Up to the sixth day the case seemed to promise a good result. The blood in the urine was daily diminishing; the vomiting, pain, and other general symptoms were abating in severity. On the seventh day the patient had a craving for solid food; this was allowed him, and from this period he retrograded, his urine again became more bloody. The solid food was, of course, at once discontinued, but it had already induced some mischief. It necessarily produced an increase of the vermicular motion in the intestines, and also caused the heart to pulsate more forcibly; and now that we are familiar with the post-mortem evidence we can see how an increased force of the circulation might, and probably did, dislocate a clot which was closing the mouth of a torn artery. On the thirteenth day the patient was going on tolerably well, a little, though a diminished quantity of blood was still in the urine, but not enough to cause anxiety. On the evening of that day he vomited, and fresh hæmorrhage immediately supervened. I think that the recurrence of the bleeding was due to the vomiting, to the severe muscular efforts displacing a clot plugging a lacerated vessel. The pure blood was doubtless arterial, which traversed the urinary passages rapidly—so soon, in fact, that it had not time to coagulate in its transit."

Later on we come to a famous passage on hæmorrhage from the urinary tract:

"You know that extravasated blood, if it continues undisturbed in any cavity inside the body, will, in clotting, assume the configuration of that cavity. And so in hæmorrhage into the urethra; if the blood remains undisturbed there a little time, it forms clots which, being casts of the canal, are lengthened and cylindrical, or ovoid transversely. If there are several clots of cylindrical shape escaping in front of the urine, you may with certainty say that they are from the urethra. But if you want to ascertain exactly their form for the purpose of diagnosis, take a little trouble about the matter, and always swim out the clots in clear, cold water in a white dish or plate, giving them time to unravel themselves. If they are long and perfectly round, the site of their retention has been anterior to the prostate; if ovoid in their long axis, or like two triangles joined together at their bases, they were moulded in the prostatic portion of the urethra, and will probably be found grooved on their under surface. Fresh blood poured out rapidly will clot along the whole length of the urethra, like macaroni. But old clots from the urethra, numerous or single, may appear cylindrical, like pancakes rolled upon themselves, until swum out in water, when they perhaps unfold. This shows a slow and limited escape of blood into the urethra.

"With hæmorrhage into the bladder, the form of the clots is determined by the shape of the vesical cavity. When first passed from the urethra such coagula may seem to be cylindrical, so that you are perhaps inclined to say that they are urethral clots; but put them into a dish of water, they will then resume their flattened, circular, true shape. If the bladder is full of clot, nothing but blood-stained serum and urine will, perhaps, escape for days, until the clot is broken up by a catheter. Coagula formed within the bladder are somewhat irregular in outline, mostly circular flattened masses, bevelled off and fimbriated. If they have remained long *in sitû* their fringed edges are white, being formed of decolorised fibrin. The fact that the shape of the clots in this case was not well defined was explained at the post-mortem examination; for the blood was not retained at one part only, but, running from the renal vessels, collected in various spots of the ruptured pelvis and the ureter. Most surgeons throw away any clot that may happen to come from the invalid; but I would suggest to you never to do so until you have thoroughly examined it. Even if there is only one single confused mass, like that blocking the eye of the catheter in our present case, I advise you to swim it out in water; the shape that it then assumes may be of great help towards your diagnosis, for it will most likely exhibit the well-known form of the space that contained it during its coagulation.

"Take another outlet; let us pass to the consideration of hæmorrhage from the anus or rectum. A patient comes to you complaining that he is losing blood from the bowel. Your first question should be, 'Does the blood precede, accompany, or follow, or is it mixed with the motion?' If it comes before the motion, it probably arises from the lower part of the rectum. If it comes during the motion, it is probably caused by the feculent matter running across the plugged-up mouth of a wounded vessel and displacing the plug. If it comes after the motion, it is evidently associated with tumour, or something of the sort, higher up in the intestine. You should then ascertain whether the blood is fresh or clotted; and if the latter, whether the clots are new or old. If it is fresh fluid blood, or bright, arterial, and fluid, it comes from the membrane near the anus. The patient may inform you that something seems to protrude at defæcation; are you to be satisfied with this? No, it is your business to ascertain the source of the blood; as honest, legitimate surgeons, you must, for the benefit of your patient, take some trouble to determine the exact nature of the malady, however disagreeable the necessary proceedings may be to you. In the case I have cited you must send your patient to the water-closet, tell him to bear down thoroughly, and examine the protruded parts. In nine cases out of ten you will see at once the source of the bleeding." Hilton, continuing, goes on to propound the following:—"*A clot of blood may destroy life in various ways*, as after cut throat, when the external wound has been sutured before the hæmorrhage is arrested; in laryngotomy, tracheotomy, or after the operation of harelip. *A clot of blood destined to arrest hæmorrhage may endanger life. A clot of blood may interfere with the success of a surgical operation.*" A wealth of illustrative cases, all eminently *ad rem*, is quoted to illustrate these maxims.

Another excellent lecture is one on tetanus. It is headed "*Simple fracture of femur. Extensive laceration of the integument. Tetanus. Recovery.*"

"Each case of fracture must be competed with on its own merits, with that kind of splint which retains the fragments in a position the nearest to the state of health. I want you clearly to recognise why in one case you employ this, and why in another instance you use that, apparatus. In this, as in all cases, pray reason for yourselves, and do not accept, without scrutiny, the dicta of the books.

"On the third day the tissues of the upper part of the thigh, which were bruised and in fact detached at the time of the accident, had become sphacelated; and the site of mortification was over the line of the femoral vessels. It was at first impossible to determine how deeply the gangrene might extend, and therefore the dresser was requested to be upon the alert, in order to compete with any hæmorrhage that might occur on the separation of the slough. But, providentially, no large vessel was opened. You may hereafter be called to attend to a large wound over the femoral vessels, and you will then be anxious to know whether hæmorrhage is likely to ensue—in other words, whether the artery is injured. If you find no interference with the temperature of the foot, and no interference with its arterial circulation, you have two points that favour greatly the idea that there is no injury of the femoral artery. But if, with a deep wound of the thigh, the foot is losing its temperature, or the pulsation in the tibials is much diminished, you must be on the look-out for secondary hæmorrhage, and be ready to adopt immediate measures for its arrest. With a large granulating surface over blood-vessels you may fairly still entertain a slight apprehension of hæmorrhage. If, however, the granulations are healthy, the underlying tissues are healthy also, the sheath over the femoral or other vessels (as the case may be) will probably not give way, and you may dismiss all fear of bleeding.

"The first indications of tetanus, which occurred on the thirteenth day, were 'jumping' of the fractured limb and rigidity of the lower jaw. The 'jumping,' as here displayed, has its origin in the central part of the spinal marrow; in other words, is due to some local disturbance of the grey matter. Trismus signifies something amiss with the fifth nerve, which supplies all the muscles of mastication. I cannot tell you exactly why this should be so, why those muscles should be almost invariably the first in which tetanic symptoms are manifested. But I think we may find an explanation in the fact that the sensitive part of the fifth nerve has very extensive structural connections with the grey matter of the upper part of the spinal marrow, and that, having more association with this same grey matter than any other nerve of the human body, the two necessarily sympathise to a very great degree.

"The pulse and respirations were scarcely at all quickened. I wish you to notice these points particularly, and also the fact that there was no difficulty in swallowing. What do you, as anatomists, infer from these statements? The pulse not being above 88 one day, nor over 94 in the next, nor above 100 at any time, showed that the heart was not very irritable, and that the ganglionic nervous system was not seriously implicated. Further, the pneumogastric nerves were not affected, since respiration was but slightly quickened, and deglutition not difficult. The boy could swallow perfectly well, consequently his pharyngeal muscles were not involved. His voice was clear, and not at all changed in character; this showed that there was no spasm of the larynx.

"It may be distressing for you to witness the violent spasms which affect the patient's voluntary muscles, but you must at the same time remember that he will not die from those. His danger must be measured by the difficulty of respiration and of deglutition that he experiences, and by the frequency of the cardiac pulsations. The chief peril arises from spasm of the heart or of the laryngeal muscles. I wish you, then, to look into a case of tetanus with care and precision, especially in regard to prognosis, and not to dismiss every case as hopeless. It is a good old professional saying that if the patient can swallow and breathe freely he will recover. Experience also teaches that if the pulse remains below 90 or 100, and the respirations are scarcely if at all quickened—that if, in other terms, neither the pneumogastrics nor the ganglionic nerves are implicated—the prognosis is good, but that as soon as the heart becomes importantly involved the prospect is almost hopeless."

The following paragraph shows—oddly as the treatment reads now-a-days—how near Hilton, with his keen powers of observation and sagacity in reasoning, had come to the great principles which lie at the root of Sir J. Lister's discovery.

"The wound in the thigh was dressed with Carron oil to prevent the escape of heat from the part, for there was a tendency to gangrene. Besides, I had another object in view, for which I ordered the dressings to be changed every third day only. This was to exclude the air, which acted as a local irritant, and was prejudicial to the boy in his then tetanic condition. The wound beneath the lint and Carron oil became covered with thick creamy pus, by which the access of air was prevented. But some one will, perhaps, be inclined to ask, 'Is atmospheric oxygen an irritant?' I will cite a few instances in which it certainly seems to be so. I have already referred to cases in which there is a very painful fissure or 'hangnail' near the root of one of the finger-nails, which, after resisting all ordinary treatment, may be cured in two or three days by placing a small piece of plaster over it. So, again, if the whole surface of a long-standing painful ulcer be touched with nitrate of silver (by which a covering pellicle of coagulated albumen is formed) the ulcer beneath will often be quickly repaired. Lastly, dust a thick layer of flour upon a portion of skin attacked with erysipelas, and note how quickly the pain and irritation will subside. Now the common source of benefit in all these instances seems to me to lie in the exclusion of the atmosphere from the diseased surfaces."

The most important of the other lectures are on fractured clavicle, senile gangrene, strangulated hernia, irreducible hernia, fractured spine, injury to the head, and concussion

With two more abstracts we will close this reference to Mr. Hilton's clinical lectures. He is speaking of the case of injury to the head :—" This boy was suffering, on admission, from concussion of the brain, and not from compression. Even though there apparently be unconsciousness in concussion, still you then have a power of arousing the brain, as was done in this boy's case; but you cannot so influence the brain, which has suffered sufficient structural injury, as to cause symptoms of compression. In arousing the patient, do not rest satisfied with simply asking the patient how he feels, or how his accident arose. If you merely speak to him, calling him by his name, he will not answer you ; but if you pinch and pull his nose, and he has within even the minimum of consciousness, he will recognise that act as an indignity, and will endeavour to resent the insult, or will flinch or turn himself in bed. Moreover, learn from some of his friends the Christian name by which he is usually accosted ; and then shout in his ear your question, addressing him first of all by the term most familiar to him, as Jack, Bob, Bill, or whatever it may be. If conscious, he will then reply to your queries."

Our last extract is from a clinical lecture on a case of "*irreducible inguinal omental hernia.*"

It is a good instance of how Hilton made his early anatomical training subservient to surgery, and his ingenious way of reasoning from anatomical facts. It proves how habitually he made matter-of-fact details interesting—to many minds, we might say, fascinating ; and it recalls those lectures where all listened intently while the surgeon spoke, and all who listened learned.

"Where the patient is always walking about, an irreducible hernia is a great nuisance, and may induce, occasionally, strangulated bowel. I have had several cases come under my notice where the patients were willing to put themselves under surgical control for a month or so, provided they could be quite sure they would get rid of the rupture. Here, then, comes an important question,—How are you to reduce an irreducible hernia ? You must make the patient lie continuously on his back ; lift up the scrotum, apply ice in a bag continually to the tumour ; give him Hyd. c. Cret., or some mercurial, each night, and a dose of white mixture (Mist. Magn. c̄ Magn. Sulph.) in the morning. Let him take good meat diet, and as little fluid as possible. Why all this? We must remember that the greater part of each of you is fluid, and that the walls and contents of the hernial sac are no exception to this general rule. Now, by making the patient lie continually on his back, and by elevating his scrotum, you facilitate the flow of venous blood from the hernia, and consequently take off a deal of congestion to which the ruptured parts were subjected so long as the patient stood or sat up. But you must impress upon him the fact that, however disagreeable to himself, he must nevertheless keep always on his back. Should his bowels be relieved, he must have a bed-pan placed beneath him. Inflexibly, I say, you must make the patient lie continually on his back in bed, with his scrotum well up. He must not be allowed to get up on any account whatever. You will, perhaps, lay great stress upon this point when you remember that the veins of the omentum have no valves—that they have no attendant arteries from the pulsation of which the venous blood-current can receive impulses to its onward course; and they, further, have no muscular force like that in the midst of which lie the veins of the extremities to aid in the accomplishment of the circulation. Why is the ice used? Cold lessens the afflux of arterial blood to a part. When applied to the tumour it diminishes the flow of blood through the vessels of the walls of the sac, and influences similarly the quantity of the blood circulating in the capillaries of the omentum or intestine. It may, in fact, do this too much, and cause gangrene. A few years since I saw a case of large umbilical hernia, with a thin layer of integuments over it, and in an old person, to which ice was applied for a few hours only; yet upon operating I found the intestines pale, flaccid, cold, stinking, and gangrenous, owing to the deprivation of blood by the too intense cold which had been employed. If the person be old and weak, and you judge him not capable of withstanding much continued deprivation of temperature, you should take away the ice and apply an evaporating spirit lotion, which is not so cold. Why use the mercury and chalk?

The contents of the sac are often glued together and to the surrounding walls by recent or old adhesions. Now mercury deteriorates the lowly vitalised fibrinous matter of which these adhesions are composed, and then the healthy serous membrane absorbs it. If irritated, serous membranes are secreting sacs, but they become absorbing surfaces as soon as the secreted materials forming the adhesions are deteriorated. *Rest* reduces notably the thickening produced by old inflammation of joints; similarly you may hope to aid absorption of the hernial adhesions by removing all disturbance of the parts, which is best done by keeping the patient quiet in bed. Why give M. M. c̄. M. S. each morning? I believe you can unload the portal system to a great extent by Epsom salts. Give also as little fluid nourishment as possible, for fluid occupies a considerable space. Meat is the best food on this account, and all apprehension of constipation is avoided by the daily dose of the white mixture."

Before leaving Hilton as a Clinical Teacher, we must refer to his *magnum opus*, his book on Rest and Pain, more exactly called 'A Course of Lectures on the Influence of Mechanical and Physiological Rest in the Treatment of Accidents and Surgical Diseases, and the Diagnostic Value of Pain.' These lectures were delivered at the College of Surgeons in the years 1860, 1861, and 1862. But of this book, one of our very few surgical classics, we shall prefer to quote the words of others. A reviewer in the 'British Medical Journal,' in noticing the second edition, which appeared in 1877, said, "Mr. Hilton's lectures on Rest and Pain are, perhaps, the most considerable contribution to surgical literature furnished by any of the professors of surgery who have occupied the chair at the College of Surgeons since Sir James Paget's celebrated lectures on 'Inflammation and the Healing Process and on Tumours' were delivered." The same reviewer pointed out as the chief merits of Mr. Hilton's book that it rebuked, and provided an admirable corrective to meddlesome and hasty surgery. Again, it abounds in the ingenious application of the facts of ordinary dissecting-room anatomy to the requirements of daily practice. "In this volume we have indubitable proofs that a patient may have suffered for years from symptoms which might have been relieved by the simplest means if the distribution of the nerves had been known and borne in mind, but which, for the want of such knowledge, or of its application, were attributed to all sorts of causes erroneously, and therefore treated with entire want of success."

A little later in the review the following passages occur:

"Can anything be more exquisitely ingenious? All that the severest critic could say is that it is, perhaps, too ingenious to be true; yet, true or no, what a light does it throw on anatomy! what an interest does this way of speculating upon facts give to their investigation! Even the errors of such a master may be rich in instruction."

"We have made these few observations on Mr. Hilton's lectures, not because we fear that any of his former hearers or readers can have forgotten his teaching, but in order to kindle a younger generation to study one of the most valuable, most practical, and at the same time most ingeniously speculative of all surgical works. Life moves fast in these railway times, and one of the evils of our rapid movement is that we are very apt to be content with a hurried glance in passing, and speedily forget things which deserve patient study and long familiarity. Such is Mr. Hilton's work; one that the student should use as his 'enchiridion,' till he has not only become familiar with the matter of his author, but has imbibed his author's habit of mind and way of study, and has prepared himself to investigate the bewildering phenomena of disease, mental and physical, with the same reliance on physiological science, the same patient observation, and the same fertility of resource."

Much more lately, in August, 1891, nearly thirteen years after Hilton had been laid in his grave, another voice was raised in praise of the author and his book. Prof. Chiene, when giving the Address on Surgery at the meeting of the British Medical Association at Bournemouth, took as his subject "Rest as a therapeutic agent in surgery." The following pithy quotation is some of the highest praise that Hilton has ever had:—"Bacon says there are books to skim over, books to read parts of, books to absorb; Hilton's book on 'Rest and Pain' is one to absorb."

This praise would have been especially gratifying to Hilton, for it is an open secret that the living surgeon who thus reverenced and praised the dead is known at Edinburgh as "honest John."

Hilton resigned his full surgeoncy in 1871, after a tenure of two-and-twenty years. As we have written this account for Guy's men, to recall him to the memory of those who honoured and valued him, and to enable generations who knew him not to form a better idea of the man, as he worked for forty-three years at Guy's, our space does not admit of our following his life beyond the walls of our hospital.

It remains to try and sketch the appearance of the man. The photograph at the beginning of this article was the only one available; it was taken after Hilton's prime, and before old age (which never came to Hilton) had had an opportunity of softening the less attractive features of his face. It does[1] Hilton justice in one sense only, and that is—"justice without mercy."[2]

No one would have thought, in looking at Hilton, that he had a great Surgeon before him. He looked much more like a prosperous City man. Short, rather stout and dapper, in a plain, black frock-coat, with faultless shirt-front and linen, a black stock or bow-tie, a fancy waistcoat, festooned with one of the old-fashioned gold chains, very neat, however, and boots with irreproachable blacking—such was Hilton's outer man as he got out of his carriage to enter the colonnade, or as he sat upon one of the beds in his wards examining an inflamed ulcer with a probe, that he might detect the position of the nerves which were exposed in the ulcer.[3]

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[1] To alter slightly the old saying, "lenit albescens *faciem* capillus."

[2] I think it is the author of the 'Horæ Subsecivæ' who says that photographs are rarely first-rate unless they be of dogs or children, or of old people, whose faces, like other old houses, are often picturesque. It is certainly that most genial and gentle of men who wrote, "Richmond pleasantly put it, and truly, to Professor Syme, when he first showed him the drawing of himself well known by Holl's engraving; the great surgeon, after scrutinising it with his keen and honest eyes, exclaimed laughing, 'Yes, it is like; but then—it is good-looking!' 'Ah, you see,' said the artist, 'we do it *lovingly*.' The best likeness of a man should be the ideal of him realised." The difference between "a Richmond" and a photograph could not be better put.

[3] To quote Dr. Wilks, "it might be a simple ulcer, which he would dilate upon until the student beheld in it something much more worthy of note than he had

Any notice of Hilton, however incomplete, should refer to the fact that certain honours fell to him, unsought, which rarely come, together, to any one Surgeon. He was appointed Surgeon Extraordinary to the Queen. In 1871 the Pathological Society, mindful of Hilton's services in years long gone by in the advancement of sound Pathology, did Hilton and itself honour by electing him President—a compliment especially high, as Hilton, though an original member, had never contributed to the 'Transactions' of the Society. But the highest of these honours was the first; in January, 1839, Hilton was elected a Fellow of the Royal Society. In the paper by which he was recommended as a Fellow he was described as "a distinguished anatomist and lecturer on descriptive anatomy at Guy's Hospital; a gentleman much attached to the sciences of human anatomy and physiology."[1] The actual work specified in the above paper as done by Hilton was, of course, the two anatomical papers published by him in our 'Reports' for 1837, one on the "Distribution and Probable Function of the Laryngeal Nerves," the other on the "Sacculus or Pouch in the Human Larynx." Hilton describes this pouch, its position, structure, and capacity, together with the numerous glands supplying it, and the muscles which act upon it; he then discusses the offices which it performs, connected directly and indirectly with the functions of the larynx. In 1838 Hilton contributed a paper to the 'Proceedings' of the Royal Society, on "The Decussation of the Fibres at the Junction of the Medulla spinalis and Medulla oblongata." It is superfluous to add that the only books which he published afterwards, viz. his 'Lectures on the Cranium' and his 'Rest and Pain,' were entirely worthy of the honour which the Society had done him, very early in his career, when only thirty-one.

The closing years of Hilton's life were overclouded with

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first considered it. It was a case of this kind in which he first discerned that the ulcerative process was kept up by the irritation of a nerve, upon the division of which the sore healed. The case became classic, and the treatment was looked upon as a great discovery, for it was long before neuritis and the effects of nerves upon nutrition had been carefully studied, and the knowledge thereby gained became the property of the profession. Other trivial complaints Hilton treated by the same scientific method.

[1] Dr. Pye-Smith.

increasing distress and suffering, owing to a carcinoma of the stomach, which proved fatal in September, 1878. But those who were much with Hilton at this time noticed that, as he faded, he softened. Many of the characteristics of old days were present almost to the last—the sagacity, the honesty, and the pungency ; but the sharpness, the austerity, perhaps we should add the bitterness, were largely gone.

One matter should be mentioned as bearing on what we have said about Hilton's blunt brusqueness, his ready rebukes (too often sarcastic and irritating), and his too easy betrayal into making jokes at other people's expense. He was on his way to Eastbourne—from which he returned quickly, and but a few days before his death—and met Mr. Couling of Brighton. After referring to his illness and fading strength, Hilton said he had been looking backwards, and added, "I know I used to be down upon the men, but I did it for their good." His old dresser and house-surgeon —then, as ever, prompt to cheer and soothe, and to say the kind word—comforted Hilton with the assurance, "I don't believe there is an old dresser of yours that doesn't think of you at least once in the day." "Do you think so," replied the dying man, "upon your honour ?"

And now my task is ended. Meagre, unsatisfactory, and far short of my desire as this article is, I trust I have enabled those who knew not John Hilton to think of him as a truly great, because a physiological and scientific Surgeon, and, as a man, as honest and straight as a man can be. My one endeavour has been with a grateful hand to trace, as faithfully as I know how, those personal outlines, and to fix those vanishing traits, which will enable posterity to identify and to individualise the man. A few years ago these dwelt very vividly in the minds of not a few of us, far better qualified than myself to do honour to Hilton's memory. Pass a few more short years, and these outlines, these traits, will have died out of men's remembrance, and, once departed, such things can never be recalled. Whether it is a student in his earlier years, when working at the anatomical models, or one of us of a senior standing, who profit by those teachings by which John Hilton contributed so largely to the more scientific treatment of surgical diseases, we should, one and all at Guy's, honour his name with the words on Wolsey's bust at Christ Church :

NOMEN INTRA HAS ÆDES SEMPER VENERANDUM

W. H. A. Jacobson.

It is very pleasing to relate that our School has lately received £100, to be spent in honouring and perpetuating Hilton's name. The donor is a warm admirer of Hilton and though not a Guy's man, has sent two sons to us.